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REMARKS

Claims 1 and 3-22 are pending in the present application. Claims 1 and 3-22 are rejected under 35 U.S.C. 103(a). The rejections are respectfully traversed in light of the following remarks, and reconsideration is requested.

Applicant first notes that this is the fourth Office Action on the merits, with rejections based on different references each time. Applicant has not amended the claims since the first Response (the Response to Final had amended claims, but the amendment simply incorporated the limitations of originally filed claim 2) and has presumably distinguished the cited references from each Office Action, including the submission of a Pre-Appeal Brief Request for Review and subsequent re-opening of prosecution. Applicant acknowledges that there is no limit on the number of Office Actions the Examiner may issue. However, according to MPEP 707.07(g), "[p]iecemeal examination should be avoided as much as possible." There are exceptions, but the exceptions do not apply to the current application. Accordingly, Applicant respectfully requests the Examiner take this under consideration.

Rejections over Thompson (U.S. 5,037,174) in view of Okubo et al. (U.S. 5,565,978)

Claims 1, 6, 7, 10, and 11 were rejected. In rejecting claim 1, the Examiner states, in part, that "Thompson does not teach that the modifying comprises removing material from at least one end of the optical fiber member. Okubo teaches removing material from an optical fiber to form a lens tip at the end of a continuous taper (column 8, lines 13-24 and column 10, lines 23-30)."

Applicant respectfully disagrees. Okubo teaches a refractive index sensor using total internal reflection of light beams. (See, e.g., col. 2, lines 33-36; Figs. 2(a), 3, 5, 6, 13, and 14). The sensor comprises one or more optical fibers 10 abutting a core glass 3. Light exiting the optical fiber(s) broadens or expands (as opposed to converging or focusing) in the core

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glass. (See, e.g., col. 6, lines 4-10 and 62-67, col. 8, lines 13-15, col. 8, line 65 to col. 9, line 2, col. 9, lines 16-18, 41-43, and 65-67, col. 10, lines 15-20; Figs. 2(a), 3, 5, 6, 13, and 14). Thus, Okubo clearly teaches a fiber that expands the exiting light. To that end, Okubo discloses that the fiber is fabricated by polishing the end of the fiber. (Col. 9, lines 16-18, 41-43, and 65-67, col. 10, lines 15-20). This is a typical and generally accepted method in the industry of broadening light beams.

The portions the Examiner point out simply state that the "expansion angle can be altered by working the end of the optical fiber, e.g., by melt processing or etching to a hemispherical lens or rounded-tip tapered shape." There are no other portions of Okubo which even mention melt processing or etching, much less provide details as to how this is done. Okubo states that the expansion angle can be altered by "working" the end of the optical fiber, such as by etching, and then states that the "ends of the optical fibers were worked by polishing". (Col. 8, lines 14-16; col. 9, lines 16-18). As discussed above, polishing is the accepted way to broaden or alter an expansion angle of the fiber. Thus, it may be that "etching" to alter the expansion angle may simply mean polishing. Regardless, this "etching" to "alter" the expansion angle is performed after the lens or end of the fiber is already formed, and not "to form an end continuously tapered to the outer circumference of the optical fiber member", as recited in claim 1.

Accordingly, Applicant believes claim 1 is patentable over Thompson in view of Okubo because the two isolated statements in Okubo of altering the expansion angle by etching do not remedy the deficiencies of Thompson as discussed above.

Furthermore, Applicant contends that Thompson and Okubo cannot be combined to maintain a 103 rejection because there is no motivation to combine. The Examiner states that the motivation is to more accurately and economically control the modification. As discussed in previous response, Thompson discloses quickly pulling apart a fiber, resulting in a

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separation into two fibers and the formation of a nipple-like extension at the ends of both fibers. The pulling action, along with exposure to an arc energy, results in the ends rounded into an aspherical shape. (Col. 4, lines 27-31, col. 4, lines 45-52, col. 4, line 63 to col. 5, line 35, col. 5, lines 41-55; Figs. 1, 2, 3A, and 3B). On the other hand, Okubo teaches polishing the end of fibers to alter the expansion angle. So, even if etching is adequately disclosed for altering the expansion angle, a combination with Thompson would simply result in the aspherical shaped ends of Thompson being polished (or etched) to alter an expansion angle. Okubo does not teach removing material to first form a continuously tapered end, since the etching or polishing is after the end is formed for altering the expansion angle. Thus, there is no reason to modify Thompson's pulling apart of the fibers with Okubo's teaching of polishing an already formed end to alter an expansion angle.

Consequently, because Applicant believes that Thompson cannot be properly combined with Okubo and/or that even if combined, would not teach the limitations of claim 1, claim 1 is patentable over Thompson in view of Okubo.

Claims 6, 7, 10, and 11 depend on claim 1 and are thus patentable over Thompson in view of Okubo for at least the same reasons as claim 1.

Rejections over Thompson in view of Okubo and Yamane et al. (U.S. 5,459,803)

Claims 3-5, 13-17, and 20 were rejected. Yamane is cited, inter alia, for "etching the at least one end of the optical fiber member". Applicant contends that the obviousness rejection under 35 U.S.C. § 103 cannot be established by combining the teachings of Thompson and Okubo with Yamane et al. because there is no suggestion or motivation in the cited references for the combination. Details as to why the combination of Thompson and Yamane is not proper have been argued and apparently overcome in Applicant's Pre-Appeal Brief Request for Review. Consequently, because the combination of Thompson, Okubo, and

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Yamane is improper, Applicant believes claims 3-5, 13-17, and 20 are patentable over Thompson and Okubo in view of Yamane.

Rejections over Thompson in view of Okubo and Cesaroni (U.S. Pub. 2003/0029040)

Claims 8 and 9 were rejected. Cesaroni is cited for disclosing removing and heating material both ends of the fiber, but does not teach removing material from the fiber to form continuously tapered ends and then applying heat to form a continuously tapered lens surface. Because Cesaroni does not remedy the deficiencies of Thompson and Okubo as discussed above with respect to claim 1, claims 8 and 9, which depend on claim 1, are patentable over Thompson and Okubo in view of Cesaroni.

Rejection over Thompson in view of Okubo and Grasso III et al. (U.S. 6,375,651)

Claim 12 was rejected. Grasso, III et al. was cited for disclosing moving the modified end of the fiber to a spark. However, Grasso, III et al. does not remedy the deficiencies of Thompson and Okubo as applied to claim 1 and discussed above. Therefore, because claim 12 depends on claim 1, claim 12 is patentable over Thompson and Okubo in view of Grasso, III et al.

Rejections over Thompson in view of Okubo, Yamane, and Cesaroni

Claims 18 and 19 were rejected. Claims 18 and 19 depend on claim 13. As discussed above, claim 13 is believed patentable over Thompson and Okubo in view of Yamane. Cesaroni is cited for disclosing removing and heating material both ends of the fiber, but does not remedy the deficiencies of Thompson, Okubo, and Yamane. Therefore, claims 18 and 19 are patentable over the cited references.

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Rejections over Thompson in view of Okubo, Yamane, and Wei et al. (U.S. Pub.
2004/0134884)

Claims 21 and 22 were rejected. Wei et al. is cited for disclosing oil placed on the top surface of an etching liquid. Wei et al. discloses coating a fiber with a "relatively thick coating layer 330" and then immersing the end of the fiber into an HF solution to form a tip of a probe. (Wei, paragraphs [0022] to [0025]; Figs. 3A-3C). Thus, in general, Wei discloses forming an end of a fiber by immersion in an etching liquid. However, as discussed above with respect to Yamane, there is no motivation in Thompson to use an HF solution to etch away material to form a lens. In addition, Wei discloses using HF solution to form the final probe tip, which is vastly different than Applicant's invention recited in claims 1 and 13, in which material is first removed to modify a fiber end and then the lens surface is formed by heating the modified end.

Therefore, because claims 21 and 22 depend on claims 1 and 13, respectively, claims 21 and 22 are patentable over the cited references.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections of the claims 1 and 3-22 under 35 U.S.C. § 103(a).

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CONCLUSION

For the foregoing reasons, Applicant believes pending claims 1 and 3-22 are allowable, and a notice of allowance is respectfully requested. If the Examiner has any questions regarding the application, the Examiner is invited to call the undersigned Attorney at (949) 752-7040.

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office, Fax. No. 571-273-8300, on the date shown below.


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April 5, 2007
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Respectfully submitted,



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